RECENT DISSERTATIONS

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Teaching for conceptual understanding in science within an integrated inquiry-based science and literacy setting

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Abstract

The main aim of this thesis is to explore how to teach for conceptual understanding in science within the framework of an integrated inquiry-based science and literacy curriculum. Throughout the thesis there is a special focus on the use and development of science words and concepts. We know that the language of science is crucial for learning science, and we also know that for many students the language of science is a barrier to learning science. Thus, how the language is used and how concepts are communicated are vital to the learning process.

Six teachers participating in a professional development course were interviewed and video-taped as they implemented an integrated science/literacy curriculum. In this curriculum, science inquiry implies that students search for evidence in order to make and revise explanations based on the evidence found and through critical and logical thinking. Moreover, the curriculum material is designed to address key science concepts multiple times through multiple modalities (do it, read it, write it, say it).

Results from the data analysis showed that the teachers found it challenging to prioritize and allocate time to discuss shared experiences from student investigations. Such discussions are vital for student learning as students are expected to consolidate new knowledge through discussing the meaning of their findings. When examining the discussions that do exist in the data material, they revealed ample opportunities to enhance student learning. However, the teachers often missed these opportunities to scaffold student understanding. Thus, a presence of a discussion is not itself sufficient to engage students in developing deeper conceptual knowledge. Additional results suggest that students need to practice the use of science words and concepts to be able to discuss their empirical findings and further their conceptual understanding. For this purpose, students need support on how to make meaning of the concepts, for instance through linking of new and familiar ideas, and through integrating the concepts in a network of related science words and concepts.

The results in this thesis contribute to the growing understanding of how to teach inquiry-based science in a way that fosters conceptual understanding, the importance of teaching the language of science, and how the integration of science and literacy support student learning.

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